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Procedia Economics and Finance 36 (2016) 345 – 352

Procedia Economics and Finance

www.elsevier.com/locate/procedia

1st International Conference on Applied Economics and Business, ICAEB 2015

Growth and Productivity; the role of budget deficit in the MENA selected countries

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Abstract

Today, efficiency is considered as one of the most effective ways of increasing economic growth by many planners and economic policy makers in different countries; further, huge investments made in this regard. On the other hand, the issue of budget deficit was introduced in economic literature since 1980s. Within this decade, current budget deficit significantly increased in the USA. Emerging of this phenomenon prompted many economists to establish public sector as the macroeconomic unbalancing factor, on the contrary to Keynesy who regarded public sector as the balance factor, particularly in developing countries since developing countries deal with specific problems such as foreign debt, high inflation, difficulties of payment balances, exchange parallel markets as well as various external shocks. Therefore, this research tried to study the effect of growth, efficiency and government budget deficit in MENA selected countries within 2000-2013 by using the recommended static panel models. Results of the estimated relations for the first model in which government budget deficit is the dependent variable indicate positive effect of economic growth and inflation rate variables as well as the negative effect of labor productivity and government budget deficit. Moreover, the second model in which economic growth is the dependent variable demonstrates the positive effect of labor productivity index and economic growth. In addition, negative correlation of government budget deficit with economic growth is also maintained.

Peer-review under responsibility of SCIJOUR-Scientific Journals Publisher

Keywords: Economic growth;labor productivity; budget deficit; MENA region

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Peer-review under responsibility of SCIJOUR-Scientific Journals Publisher
doi:10.1016/S2212-5671(16)30046-6

1. Introduction

Today, improved efficiency has been interested by many planners and economic policy makers in many countries, as one of the most effective ways of increasing economic growth rate; in addition, many investments made in this regard. Investments on enhanced human capital, research and development and like are of states measures to improve efficiency, which results in economic growth and economic development. If achieving high levels of development is of countries' primary goals, it may not realize disregarding research and development. On the other side, the issue of budget deficit introduced since 1980s in economy literature when the current budget deficit significantly increased in the US. Emerging of this phenomenon prompted many economists to establish public sector as the macroeconomic unbalancing factor, on the contrary to Keynes who regarded public sector as the balance factor, particularly in developing countries since developing countries deal with specific problems such as foreign debt, high inflation, difficulties of payment balances, exchange parallel markets as well as various external shocks. Therefore, regarding the aforementioned, studying effective factors of efficiency and growth are of special place; further, continuous efforts and many studies conducted at countries and even enterprises levels in order to identify the requirements and to offer proper solutions. According to this perspective that in a dynamic economy usually the enterprises with higher level of efficiency survive in production cycle comparing other enterprises, several studies focused on the effect of efficiency and its growth on exiting noneconomic and inefficient enterprises from activity cycle. One of the effective variables in the area of international competition of enterprises influencing countries' business deficiency is government budget deficit.

Abundant experimental and theoretical studies conducted in the area of the relationship between state budget deficit and economic growth with the interest of all production factors at international level. In this regard and along with the experimental studies, the present research investigated the relationship between economic growth and labor productivity and the effect of budget deficit on the economic growth of MENA countries within 2000-2013. The next section introduces theoretical basics including provided theories and the results of experimental studies on this issue. Section 3 indicates model, research methodology and tests. Section 5 explains test results and model estimation. The last section concludes this paper.

2. Literature Review

Budget deficit is the economic challenge of many countries in recent decades. This problem is more widely seen in developing countries, as they are deprived of efficient private sector. This leads to extending governmental activities and increasing government economic share in such countries such that a main share of total demand is assigned to expenditure and government investment. In contrast, in revenue side, government lacks adequate revenues to cover its huge expenses. The result of such process in these countries is nothing but permanent budget deficit. If government relies on banking resources for financing the budget deficiency, it may lead to economic inflation such that internal (domestic) imbalance would also transfer to the external economic sector, since increased government expenditure initially leads to increased growing of total demand. While, government increased expenditure at total supply side may not result in increased supply due to economy's structural problems and total supply unattractiveness. The ultimate result of these effects is emerging of inflation in the economy. In this situation, importing increases and exporting decreases. Thus, imbalanced state budget transferred to the external part causing current account deficit in these countries. Afonso and Tovar Jalles (2011) in a study examined the effect of budget deficit (from state debt point of view) and total efficiency of production factors on the economic growth of 155 countries selected around the world. Research results demonstrate that state debts have a negative, significant effect on economic growth; whereas, total efficiency of production factors has positive, significant impact. Marashdeh and Salman Saleh (2006), in a research studying government budget deficit and trade deficit, found out that trade deficit in Lebanon had a long-term impact in budget deficit. Salman Saleh (2006) also believes that there is a positive, significant relationship between trade deficit and budget deficit in Lebanon. In his attitude, trade deficit reduction policies were effective for decreasing budget deficit in Lebanon. Vito Tanzi (1985) in finding the answer to the question that whether the historical and unprecedented budget deficit in USA experienced in 1980-1984 may be real as one of the explaining factors of high rate of interest, believes that interest rate indeed is positively related to budget deficit and public debt level; further, given the constant conditions, interest rate increased by increased

budget deficit. In his opinion, major increase in real interest rate during 1981-1984 was independent of financial variables and economic conditions such as rules revision in financial market, migration, change in monetary policies and more importantly change in tax regulations played a critical role in changing this period interest rate. Several perspectives formed in the domain of budget deficit influencing economic growth and efficiency of production factors; though, the views are inconsistent in many aspects:

2.1. Keynesian theory

The Keynesian macroeconomics theory indicates that budget deficit should be applied as a means of improving economic status and as a proper policy, should enable politicians to maximize social welfare. Thus, in Keynesian perspective, governments deal with the variables of production growth and unemployment; it also follows the policy that minimizes the difference between real unemployment and normal level of unemployment. Therefore, Keynesian theory predicts that budget deficit is negatively correlated with unemployment; whereas, budget deficit is positively related with economy's real growth rate. Therefore, economic growth rate variable is introduced as changes in gross domestic product (GDP) growth to examine this theory. The variable coefficient demonstrates that financial policies must be employed in a way that leads into improved economic production level (Roubini and Sachs, 1997).

2.2. Ricardian Equivalence

David Ricardo initially introduced this theory, which was finally completed by Robert Baroo. This theory created based on the two assumptions of rational expectations that households are prospective and households' visions until taxation. As taxes reduced and budget deficit supplied through borrowing, the government would have no choice of increasing taxes in the future in order to repay the debts and interests. According to this perspective, Ricardo believes that people found out by experience that increased government bond as a result of reduced taxes offers a temporary income (revenue) for the individual at the present time. Following increased government debt, these consumers save more to provide higher tax paying in the future; thus, increased public saving offers more credit to families and economic enterprises. As a result, increased loan demand by government would be compromised by higher saving; therefore, interest rate remains unchanged, and the decrease in taxes may not lead to permanent revenue, households save temporary income with no change in order to pay the future tax liabilities, in term of savings, caused by current tax cuts. So, any reduction in current tax must be consistent with increase in future taxes; further, augmenting of private saving would totally compromise reduction in public sector savings. National saving and thus interest rate remain unchanged, which consequently leads to unchanged private sector investment. In other word, the effects of tax cut resulted from budget deficit cause properly increasing of private sector saving; according to logical consumption by consumers and regarding permanent consuming of consumers, no change in national savings may lead to no change in interest rate.

Ricardo believed that budget deficit increased due to increasing costs of government, which may be paid now or in a later time. Therefore, tax cuts generated by the policy of budget deficit have no effect on consumption and saving; it employs no change on other economic variables including economic growth through this (Mangio, 2004).

2.3. Optimized finance theory

According to Barro (1974) theory, households definitely predict the government increases taxes in the future due to the generated budget deficit. Therefore, the government issues bonds in the present time; increased bonds are not considered as wealth by public in order to obtain more consumption (this is known as Ricardian equivalence assumption earlier discussed). Probably tax payers save tax cut revenues at the present time meaning that as if permanent tax cut never occurred in the economy. In this regard, Barro (1974) presented a model by which individuals borrow from government according to predicting government budget deficit by state financial deficit, save the loan and pay the loan interest as tax; therefore, budget deficit in long-term is not an effective means for lessening the crisis. The question raised here by Barro is that why politicians use budget deficit for improving production variations and economic crisis?

The questioned is answered in this way that business cycles including tax fluctuations require deficit in recession and surplus in prosperity; in this way, the government keeps tax rate and expenditure constant and achieves macro balance. Thus, optimized finance theory explains budget deficit policy that budget deficit is positively related to general government expenditure deviation from normal way and negatively related to deviation of economic productions. It stated that Barro used a linear relationship between income and government expenditure for its theory.

2.4. Public choice theory

This theory claims that budget deficit results from pressures of various political institutions such that different institutes apply various pressures on politicians to meet their objectives. Hence, these pressures may lead to state budget deficit. Different public choice theories are discussed as follows (Buchanan, 1967).

3. Methodology and Data

This research studied mutual effects of budget deficit, labor productivity, and economic growth through using static panel method. Panel data method characterized with high capability in identifying and measuring the effects, which are not easily predicted in cross-section and particular time series studies, more flexibility, less co-linearity, larger degree of freedom as well as higher efficiency. Data of ten selected countries of MENA region including Egypt, Iran, United Arab Emirates, Jordan, Kuwait, Lebanon, Morocco, Oman, Syria and Tunisia within 2000-2013 as well as panel econometric technique applied through using Estimated Generalized Least Squares (EGLS) method. Considered models introduced as equation 1 and equation 2.

- First model

$$BD_{it} = \alpha_0 + \alpha_1 LP_{it} + \alpha_2 GDP_{it} + \alpha_3 INF_{it} + \varepsilon_{it} \quad (1)$$

- Second model

$$GDP_{it} = \beta_0 + \beta_1 LP_{it} + \beta_2 BD_{it} + \beta_3 INF_{it} + \varepsilon_{it} \quad (2)$$

Where, BD is Government Budget deficit: LP: Labor productivity; INF: Inflation; and GDP is Gross domestic product (% GDP Growth), which is the economic growth factor.

4. Empirical Results

Following Unit root Test and Cointegration Test, it is necessary to conduct diagnostic tests to determine the estimation model. Group significance test used to ensure the significance of sample group by using F-Limer test. If F statistic is larger than the tabular F, H0 of equal intercept rejected; then, it requires considering several intercepts; thus, the panel method is used for estimation. Now, Hausman Test was used to find the answer to the question that whether the difference in intercept of sectional units operates steadily or random performances may explain the difference between units more clearly. Hausman Test examines H0 indicating consistency of random effect estimations versus H1 dealing with inconsistency of random effect estimations. If H0 rejected, steady effect estimation would be used. Otherwise, random effect estimation is applied. Results of F Limer and Hausman tests in selecting the considered model are presented in table 1.

Table 1. Results of selecting model estimation method

Test	Test statistic	Test statistc value	Prob

F bounded for the first model	F	4.94	0.0000
F bounded for the second model	F	4.93	0.0000
Hausman test for the first model	H	1.72	0.4227
Hausman test for the second model	H	0.30	0.9606

Credit: researcher findings

According to F Limer test, fixed and random effects methods, which have high explanatory power and consider individual effects were accepted. However, it requires performing Hausman test to select the proper model of the two fixed and random effect models. Hausman test result approves random effect model for both models.

4.1. Wooldridge test

Wooldridge test is one of the tests used for detecting autocorrelation (serial correlation) in panel data. H0 assumes lack of autocorrelation in panel data; whereas, H1 hypothesizes existing of autocorrelation of panel data. Table 2 represents test results.

Table 2. Results of serial autocorrelation test

Test	Test statistc value	
		Prob
Wooldridge test result for the first model	371.053	0.0000
Wooldridge test result for the second model	12.605	0.0062

Credit: researcher findings

According to Wooldridge test results, H1 of existing autocorrelation in panel data maintained at the probability of 99%. Panel data estimated using fixed and random effect models in the existence of first order autocorrelation (AR1) through Stata software.

4.2. Results of first model estimation

Table 3 outlines the results of first model estimation.

Table 3. Results of first model estimation (Budget deficit as dependent variable)

Variable	Random Effects (AR1)	Fixed Effects (AR1)
Fixed coefficient	11+3.49 e	4.42e+11
	)(0.0000	(0.0000)
GDP	0.5309829	0.5208441
	(0.0000)	(0.0000)
LP		
	- 3.46 e+10	- 4.34 e+10
	(0.0000)	(0.0000)
INF	1.67 e+08	1.80 e+08
	(0.0000)	(0.0003)
R2=0.9678		
F=1333.59	prob(F − Statistic)= 0.0000	

Credit: researcher findings

Regarding to Hausman test result that random effect model was accepted, results of estimating first model indicate positive effect of economic growth and inflation rate variables on government budget deficit. In addition, it also reveals the negative relationship between labor productivity and government budget deficit. It is known that according to theoretical and economic discussions, any increase in economic growth and improved production would intensify government incomes and reduce government budget deficit. However, the major issue most North African and Middle East countries (MENA region) encounter is single-product economy and in most cases oil revenue dependent economy. This dependence on oil revenue made them consumer countries; the rise of oil price in recent years provided the opportunities of higher foreign exchange earnings. It is known that one consequence of increased exchange price for consumer nations is intensified importing costs, which leads to higher government expenditures and heightens government budget deficit; therefore, it is not surprising to expect the positive correlation between government budget deficit and economic growth. Moreover, estimation coefficient of labor productivity is significant at confidence level of 99% demonstrating that more attention to labor issue provides the chance of reduced government budget deficit. However, it was better if the research studied life expectancy or health variable in order to investigate the effect of this variable on labor productivity and to show to what extent life expectancy and worker health, which undoubtedly manifest through improving labor productivity, were considered. This issue can be studied in further research.

As mentioned in section two and theoretical issues of budget deficit, according to the conducted investigations, it is clear that Keynesian theory is totally functional in MENA countries. In Keynesian opinion, production growth and unemployment are the variables governments encounter. Keynesian policy minimizes the difference between real and normal unemployment. Thus, Keynesian theory predicts that budget deficit is negatively correlated with unemployment; on the other hand, it is positively related to the economy real growth rate. Therefore, economic growth rate variable introduced as changes in GDP growth and the variable coefficient shows that financial policies must be applied in a way that leads to improved economic production level. However, it seems that the understudied countries violated public choice theory, as according to experimental studies, the number of parties has no such effect on government budget deficit or surplus. It may be attributed to lack of strong parties in these countries. Moreover, fitting results also reveal that increased inflation leads to higher government expenditures and consequently intensified government budget. Therefore, governments require adopting proper monetary and financial policies and careful budgeting for reducing inflation.

4.3. Results of second model estimation

Table 4 represent the results of second model estimation.

Table 4.Results of second model estimation (Economic growth as dependent variable

Variable	Random effects (AR1)	Fixed Effects (AR1)
Fixed coefficient	1.48e +12	1.72 e+12
	(0.0000)	(0.0000)
BD	-5.65+e 08	-5.93+e08
	(0.066)	(0.0000)
LP	1.81+e11	1.70E +11
	(0.0000)	(0.0000)
INF	7.70e +08	7.53+ e08
	(0.1111)	(0.1333)
R2=0.8851		
F= 171.98	prob(F − Statistic)= 0.0000	

Credit: researcher findings

Results of estimating second model based on random effects model indicate the positive influence of labor productivity and positive growth; furthermore, negative correlation of government budget with economic growth was also maintained. In interpreting the first model we mentioned that the main government income source of most understudied countries is oil revenues. Economic dependence on oil revenues as well as the consumer attribute of most considered countries prepared the situation for increasing importing costs causing augmented government expenditures and budget deficit. Therefore, careful and specific attention to the issue of budget deficit and applying the ways of reducing this deficit provides the opportunity of economic growth. Moreover, labor productivity coefficient and the positive effect of this variable shows that the more attention to labor productivity, the higher GDP and economic growth. Lack of correlation between inflation and economic growth variables in understudy countries may attribute to countries' governmental economic and production activities in which issues other than price considerations were involved in determining production level such that inflation effect in economy did not significantly reduce actual production. Moreover, increased demand due to population growth and uncontrolled inflation rate may lead to nothing but skyrocketing import (consuming goods) in these nations' economy; this issue causes divergence in the economic growth rate and inflation rate.

5. Conclusion

In MENA countries, the large portion of budget deficit often financed through borrowing from central bank, which at the same time increases government debt to central bank, liquidity and inflation. On one hand, increased liquidity intensifies effective demand as well as importing due to inadequate domestic supply. On the other hand, internal higher general level of prices (due to inflation) may lead to more expensive exporting goods; therefore, reduces exporting. Finally, increased importing and reduced exporting worsens current account balance meaning that budget deficit created through both financial and monetary expansions; further, the generated inflation causes higher current budget. Thus, it is necessary that government offers adequate ways of achieving balanced budget through adopting proper monetary and financial policies and suitable budgeting. Regarding the positive role of human capital (labor improved quality) in nations' economic growth, the government requires attempting in human capital investment through the following ways:

-Considering the positive relation of inflation rate with budget deficit and economic growth rate, the governments require accelerating economic growth through implementing economic stabilization policies, inflation containment along with reduced risk and uncertainty as well as creating economic stabilization, and providing the conditions of decreasing budget deficit in the economy of understudied countries. As inflation, up to a certain rate, may positively influence budget deficit and economic growth; then, it may serves as an antigrowth factor extending budget deficit.

-According to the positive relation of budget deficit and economic growth in the first model, which is justifiable in investment costs perspective, it is necessary to properly design and implement economic policies to put the optimized integration of costs and revenues in government budget basket. As lack of coordination of costs and revenues gradually leads into reduced economic growth and significantly increases budget deficit; in other word, it disrupts the economic performance.

-Government budget deficit can be financed through selling government bonds; however, major part of government budget deficit in MENA countries financed through banking facilities and some through exchange saving account withdrawal and oil revenues. Therefore, government extended utilization of banking facilities causes some limitations for private sector credits, increases interest rate, reduces production and leads to recession in the country. On the other side, reduced production causes higher prices followed by higher inflation and finally inflation recession emerges. Thus, governments must seriously seek for reducing budget deficit in order to avoid inflation recession problem. Therefore, it recommended that the government adopts proper monetary and financial policies and careful budgeting plan to achieve balanced budget.

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